

DC/DC converter

0 to 13V/300mA output type

BP5812

Absolute Maximum Ratings

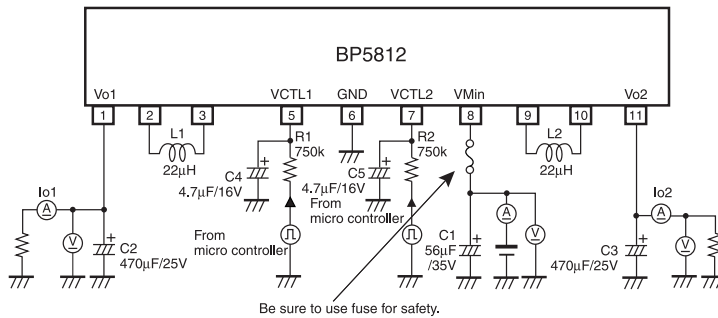
Parameter	Symbol	Limits	Unit
Motor driving supply voltage	V _{MIN}	20	V
CTL input voltage	V _{CTL}	-0.3 to V _{MIN}	V
Maximum output current	I _o	500	mA
Operating temperature range	T _{opr}	-20 to +70	°C
Storage temperature range	T _{stg}	-30 to +80	°C
Maximum surface temperature	T _{cmax}	100	°C

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Motor driving supply voltage	V _{MIN}	13.0	14.0	15.0	V	
CTL input voltage	V _{CTL}	0	-	5	V	
CTL input frequency	f _{CTL}	50	-	-	Hz	
Output voltage channel1,2	Vo _{1,2}	12.5	13	13.5	V	V _{MIN} =14V, V _{CTL} =5V
		12	12.6	13.5	V	V _{MIN} =13V, V _{CTL} =5V
		5.5	6.5	7.5	V	V _{MIN} =14V, V _{CTL} =2.5V
Output current channel1,2	I _{o1,2}	-	-	300	mA	V _{MIN} =14V, V _{CTL} =5V
Output ripple voltage1,2	V _P	-	0.10	0.15	V _{p-p}	V _{MIN} =14V, V _{CTL} =5V
Power conversion efficiency	η	84	92	-	%	V _{MIN} =14V, V _{CTL} =5V

Application circuit

- Pulse signal is converted with DC and can be operated from micro-controller by connecting smoothing capacitor to pin4 and pin8. Changing pulse duty enables to change output voltage and control rotation of the motor.



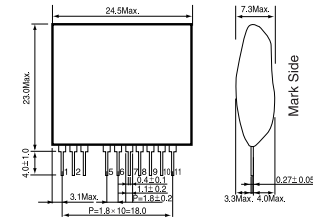
External components setting

- C1: Capacitor for input voltage smoothing
56µF/35V Low impedance for power supply
Recommendable : ZL series/Rubycon
- C2,C3: Capacitor for output voltage smoothing
470µF/25V Low impedance for power supply
Recommendable : ZL series/Rubycon
- C4,C5: Vctl smoothing capacitor
4.7µF/16V Normal products
Recommendable : YXA series/Rubycon
- L1,L2: Coil for switching regulator
22µH Rated current 1.2A or higher
Recommendable : RCH-114 series/Sumida
- R1,R2: Vctl divider resistor
750kHz ± 1% 63mW or higher
Recommendable : MCR03 series/ROHM

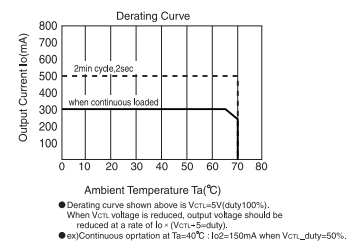
Terminal function

Pin No.	Terminal	Terminal function
1	Vo1	Power supply output pin for driving motor (CH1 side). Please connect a capacitor. (470µF/25V ZL series/Rubycon recommended)
2,3	L1	Choke coil connection pin (CH1 side).
4	Vctl1	Output pin variable pin (CH1 side) DC voltage of 0 to 5V is inputted by external resistor. Output voltage value can be changed by changing DC voltage to linear. It also can be controlled with pulse Duty of 0V/5V by connecting external capacitor.
5	VMin	Power supply input pin for driving motor(CH1 side). Please connect a capacitor to each pin. (56µF/35V ZL series/Rubycon recommended)
6	GND	GND pin.
8	Vctl2	Output pin variable pin (CH2 side) DC voltage of 0 to 5V is inputted by external resistor. Output voltage value can be changed by changing DC voltage to linear. It also can be controlled with pulse Duty of 0V/5V by connecting external capacitor.
9,10	L2	Choke coil connection pin (CH2 side).
11	Vo2	Power supply output pin for driving motor (CH2 side). Please connect a capacitor. (470µF/25V ZL series/Rubycon recommended)

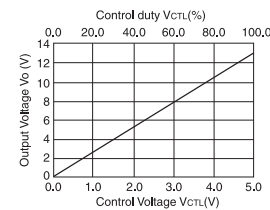
Dimension (Unit : mm)



Derating Curve



Output voltage control characteristic



Vo-Vctl characteristics		
Output voltage V _o	Control voltage V _{ctl} [V]	Control duty V _{ctl} [%]
0	0	0
6.5	2.6	52.0
7	2.78	55.6
8	3.15	63.0
9	3.52	70.4
10	3.89	77.8
11	4.26	85.2
12	4.63	92.6
13	5.00	100.0

Precautions on Use of ROHM Power Module

Safety Precautions

- 1) The products are designed and produced for application in ordinary electronic equipment (AV equipment, OA equipment, telecommunication equipment, home appliances, amusement equipment etc.).
If the products are to be used in devices requiring extremely high reliability (medical equipment, transport equipment, aircraft/spacecraft, nuclear power controllers, fuel controllers, car equipment including car accessories, safety devices, etc.) and whose malfunction or operational error may endanger human life and sufficient fail-safe measures, please consult with the Company's sales staff in advance. If product malfunctions may result in serious damage, including that to human life, sufficient fail-safe measures must be taken, including the following:
 - [a] Installation of protection circuits or other protective devices to improve system safety
 - [b] Installation of redundant circuits in the case of single-circuit failure
- 2) The products are designed for use in a standard environment and not in any special environments. Application of the products in a special environment can deteriorate product performance. Accordingly, verification and confirmation of product performance, prior to use, is recommended if used under the following conditions:
 - [a] Use in various types of liquid, including water, oils, chemicals, and organic solvents
 - [b] Use outdoors where the products are exposed to direct sunlight, or in dusty places
 - [c] Use in places where the products are exposed to sea winds or corrosive gases, including Cl₂, H₂S, NH₃, SO₂, and NO₂
 - [d] Use in places where the products are exposed to static electricity or electromagnetic waves
 - [e] Use in proximity to heat-producing components, plastic cords, or other flammable items
 - [f] Use involving sealing or coating the products with resin or other coating materials
 - [g] Use involving unclean solder or use of water or water-soluble cleaning agents for cleaning after soldering
 - [h] Use of the products in places subject to dew condensation
- 3) The products are not radiation resistant.
- 4) The Company is not responsible for any problems resulting from use of the products under conditions not recommended herein.
- 5) The Company should be notified of any product safety issues. Moreover, product safety issues should be periodically monitored by the customer.

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